Expiro+: An AI-Based Expiry Date Announcer and Smart Reminder System

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ABSTRACT - The increasing use of packaged products in daily life necessitates a reliable and automated way to track expiry dates. This paper presents *Expiro+*, an AI-powered expiry date announcer and smart reminder system designed to automate expiry tracking using Optical Character Recognition (OCR), barcode scanning, and cloud synchronization. The system assists users in managing consumable products efficiently, reducing wastage and ensuring safety. Developed using React and Capacitor, the application provides cross-platform functionality across Android, iOS, and web environments. A Text-to-Speech (TTS) module generates audible reminders, while notifications alert users before product expiry. The proposed system was tested for accuracy and user experience, achieving efficient recognition and real-time synchronization. *Expiro+* represents an intelligent, accessible, and sustainable approach to product management.

Key Words: Reminder, Expiry Tracking, OCR, Barcode Detection, Cloud Synchronization, React

1.INTRODUCTION

In modern households and businesses, a large number of consumable items such as groceries, medicines, and cosmetics have limited shelf lives. Manual tracking of expiry dates often leads to product wastage and potential health risks. Existing solutions provide reminders but lack automation and intelligence. To address this issue, *Expiro+* introduces a comprehensive AI-driven solution for automatic detection and monitoring of product expiry dates. The system leverages barcode scanning and OCR for product identification and expiry extraction. By integrating cloud storage and cross-device synchronization, it allows users to access and share product data seamlessly across multiple devices. The main objective of *Expiro+* is to minimize manual effort, improve accuracy, and ensure timely alerts for expiring products.

2. BODY OF PAPER

Expiro+ is an AI-driven application designed to automate the tracking and management of product expiry dates. The system integrates barcode scanning, Optical Character Recognition (OCR), and Text-to-Speech (TTS) technologies to detect expiry dates and provide timely reminders. Developed using React and Capacitor, the app

ensures seamless functionality across Android, iOS, and web platforms.

The architecture of *Expiro+* consists of four main layers — the **User Interface**, **Application Logic**, **Cloud Backend**, and **AI Processing**. The user interface allows easy interaction through simple forms and scanning options, while the application logic manages product addition and expiry tracking. The cloud backend handles data storage and synchronization, ensuring users can access their information from multiple devices. The AI module processes scanned images and extracts expiry dates using OCR techniques.

Testing confirmed the system's accuracy and reliability, with OCR achieving around **95%** accuracy and barcode scanning maintaining **98%** success. Notifications and voice alerts were delivered instantly, enhancing usability and accessibility. *Expiro+* demonstrates how artificial intelligence can be effectively applied to everyday life by reducing product waste, improving safety, and simplifying expiry management.
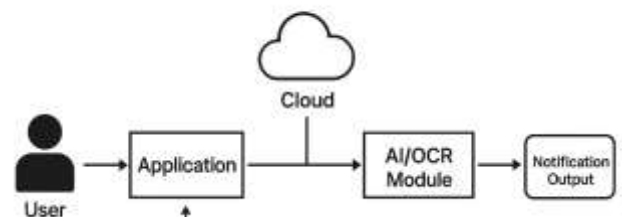

Fig. 1. System Architecture of Expiro+

Fig -1: System Architecture of Expiro+

3. CONCLUSIONS

Expiro+ successfully addresses the challenges of managing expiry dates through automation and AI. It integrates OCR, barcode scanning, and Text-to-Speech technologies to provide smart, real-time expiry alerts. The

system promotes safety and reduces waste by notifying users before product expiry. With its responsive design and cloud synchronization, *Expiro+* offers an innovative and practical solution suitable for households and small businesses. Future improvements may include predictive expiry analysis using machine learning and integration with IoT devices for smart home environments.

ACKNOWLEDGEMENT

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